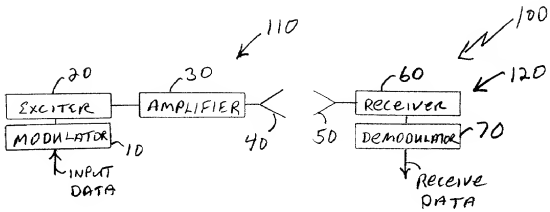
110
100
20
30
60
120
EXCITER
AMPLIFIER
RECEIVER
MODULATOR
10
40
50
DEMODULATOR
70
INPUT DATA
RECEIVE DATA

FIG. 1

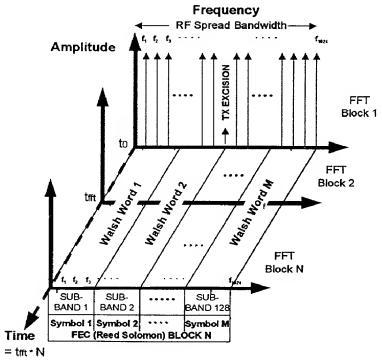
Frequency
RF Spread Bandwidth
Amplitude
TX EXCISION
FFT Block 1
FFT Block 2
FFT Block N
to
tm
Walsh Word 1
Walsh Word 2
Walsh Word M
SUB-BAND 1
SUB-BAND 2
SUB-BAND 128
Symbol 1
Symbol 2
Symbol M
FEC (Reed Solomon) BLOCK N
Time
= tm * N

FIG. 1A

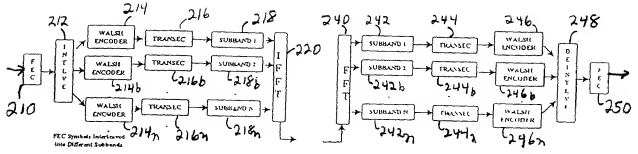
212
214
216
218
220
240
242
244
246
248
210
FEC
INTLVR
WALSH ENCODER
TRANSEC
SUBBAND 1
SUBBAND 2
SUBBAND N
IFFT
FFT
DEINTLVR
250
214b
216b
218b
242b
244b
246b
214n
216n
218n
242n
244n
246n
FEC Symbols Interleaved into Different Subbands

FIG. 2A

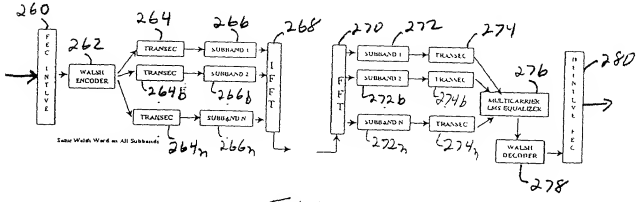
260
262
264
266
268
270
272
274
276
278
280
FEC
INTLVR
WALSH ENCODER
TRANSEC
SUBBAND 1
SUBBAND 2
SUBBAND N
IFFT
FFT
MULTICARRIER CDE EQUALIZER
WALSH DECODER
DEINTLVR + FEC
264b
266b
264n
266n
272b
274b
272n
274n
Same Walsh Word on All Subbands

FIG. 2B

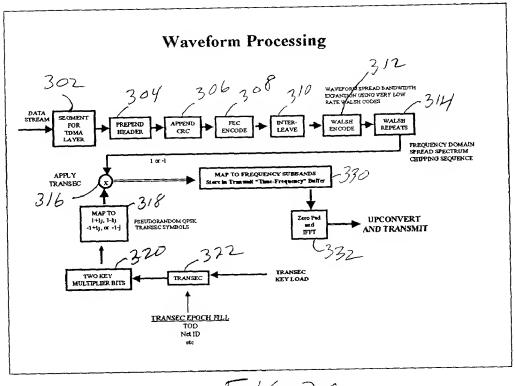
Waveform Processing
302
304
306
308
310
312
314
DATA STREAM
SEGMENT FOR TDMA LAYER
PREPEND HEADER
APPEND CRC
FEC ENCODE
INTER-LEAVE
WALSH ENCODE
WALSH REPEATS
WAVEFORM SPREAD BANDWIDTH EXPANSION ZERO PERT LOW RATE WALSH CODES
FREQUENCY DOMAIN SPREAD SPECTRUM CHIPPED SEQUENCE
1 or -1
APPLY TRANSEC
316
MAP TO FREQUENCY STREAMS Sent in Transmit "Time-Frequency" Buffer
330
318
MAP TO (+1, -1) -1+j, or +1-j
PSEUDO-RANDOM QPSK TRANSEC SYMBOLS
Zero Pad and IFFT
UPCONVERT AND TRANSMIT
332
320
322
TWO KEY MULTIPLIER BITS
TRANSEC
TRANSEC KEY LOAD
TRANSEC EPOCH FILL
TOD
Net ID
etc

FIG. 2C

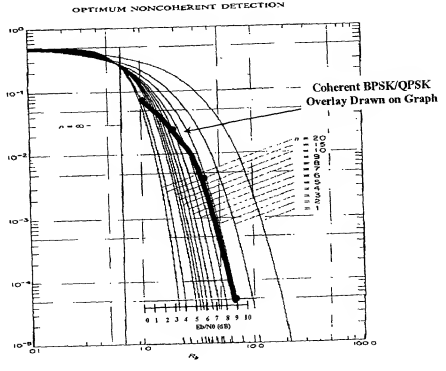
OPTIMUM NONCOHERENT DETECTION
Coherent BPSK/QPSK
Overlay Drawn on Graph
Eb/N0 (dB)

FIG. 3